Unit 1: Constructions Day 1 **Name:**___________________________

You may <u>only</u> use a <u>straight edge</u> and <u>compass</u> to do these constructions. Clearly show your construction markings so that your method is clear. Write short clarifying instructions so that you remember your method if needed.

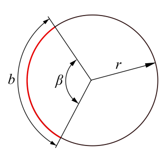
<u>Technical Tips:</u> **Use a sharp pencil**. Make sure the paper is not on or in a binder and that you have a flat surface to work on. Larger constructions usually prove to be easier and more accurate.

Construct a segment congruent to a given segment:

Why does this work?

Think about a compass - it's great at making circles, right? What could you say about all these radii (plural of radius) below?

Okay, now when you swoop the compass to make an arc (like the one labeled "b" below), what do you notice about the lines at either end of the arc?



So how can you use this information to help explain why your construction for copying a line works?

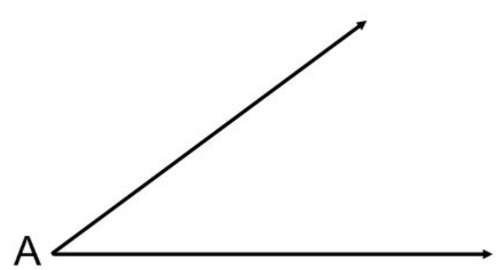
A'•

Construct an angle congruent to a given angle:

For this one - think back to our triangle congruence unit. What was the SSS conjecture? What did it prove?

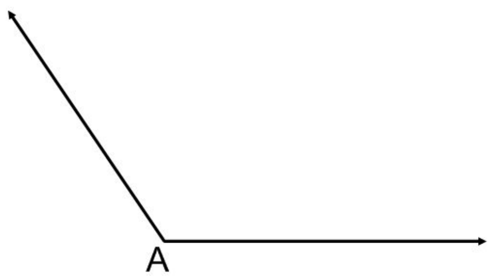
One other letter jumble - CPCTC - if we COULD prove triangles congruent by SSS, how could we then prove that corresponding angles are congruent?

All right, let's put it all together. How does SSS and CPCTC relate to your construction copying an angle?



A'•

Try with an obtuse angle:



A’

Equidistant

Construct the line segment from D to E. Find 8 points equidistant from point D and point E. Use your compass to do this. REMEMBER, a compass is an “EQUI-(equal)-DISTANCE” MAKER. Once you have 8 points connect them with your straightedge. If all the points are the same distance from the two endpoints, that means the place where your new line crosses DE is exactly ____________________ between D & E. **Measure the angle with a protractor.**

D E

Construct a perpendicular bisector:

Here’s another way to think about this. What do we know about the sides of an equilateral triangle?

Make your line segment the base of your equilateral triangle. How could you figure out where the other two sides OF THE SAME LENGTH as your line segment will meet ABOVE your line segment?

Now repeat the same process to make another equilateral triangle BELOW your line segment.

What shape have you made (HINT - think about what you know about the length of all 4 sides?)

What do you know about the diagonals of this shape?

Draw a line segment with endpoints A and B. Then construct the perpendicular bisector to this segment.

Construct an angle bisector:

Here's another way to think about this.
What do you know about the segment lengths you create with your first two arc marks on the lines that create the original angle?

When you move your compass to the endpoints of each segment and make two more arc marcs that intersect inside of the angle, what do you know about the distance from the endpoints to the point of intersection?

What 4-sided shape have you created? (There could be two possibilities)

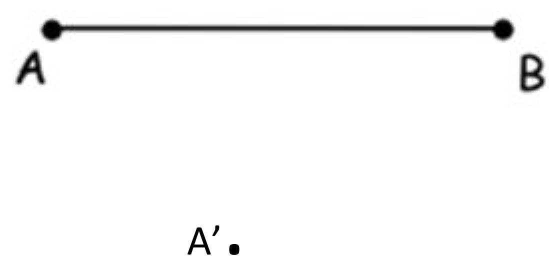
What do you know about the diagonals of these shape as it relates to the opposite angles? (Use your quadrilateral properties notes to help)

Draw an angle and label it A. Then construct a ray that bisects this angle. What must be true about this ray?

Construct a parallel line through the given point A' (Angle Copy Method)

List the steps you took to complete the construction

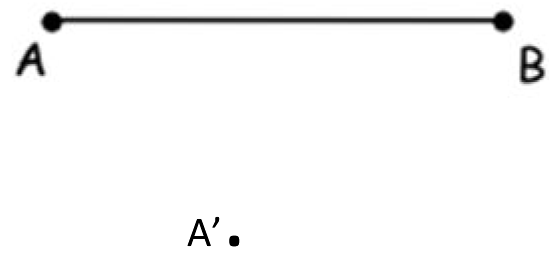
Why does this work? Which angle properties about parallel lines have you used to confirm your new constructed segment is parallel to $\overline{AB}$?



Construct a parallel line through the given point A’ (Rhombus Method)

List the steps you took to complete the construction

Why does this work? What are the properties of a rhombus that confirm your newly constructed segment is parallel to $\overline{AB}$?



Questions I have	Notes from my work
Summary of what I’ve learned in this packet	